by area; hence $D=\frac{1}{2}\times6\times4\times2\sqrt{\frac{133}{13}}\div\frac{48}{13}\sqrt{10}=\sqrt{43.225}=65.7457223-$.

**7. Proposed by WILLIAM HOOVER, A. M., Ph. D., Professor of Mathematics and Astronomy in the Ohio University, Athens. Ohio.**

Through each point of the straight line $x=my+h$ is drawn a chord of the parabola $y^2=4ax$, which is bisected in the point. Prove that this chord touches the parabola $(y+2am)^2=8a(x-h)$.

**Solution by the Proposer.**

Let the chord be $gx+fy=1\ldots.(1)$.

This cuts the curve $y^2=4ax\ldots.(2)$, in the points whose co-ordinates are given by the equations

$$x^2-\frac{2(g+2af^2)}{g^2}x+\frac{1}{y^2}=0\ldots.(3),\text{ and}$$

$$y^2+\frac{4af}{g}y-\frac{4a}{g}=0\ldots.(4).$$

The middle of the chord is then $\left(\frac{g+2af^2}{g^2},-\frac{2ag}{f}\right)$.

If this point be on the line $x=my+h\ldots.(5)$,

$$\frac{g+2af^2}{g^2}=-\frac{2amf}{g}+h\ \ldots(6),$$

$$\text{or, } g+2af^2=-2amfg+hg^2\ldots.(7).$$

Making this homogeneous by aid of (1),

$$(h-x)\frac{g^2}{f^2}-(y+2am)\frac{g}{f}-2a=0\ldots.(8),$$ a quadratic in the undetermined constant $\frac{g}{f}$, and giving the envelope $(y+2am)^2=8a(x-h)$.

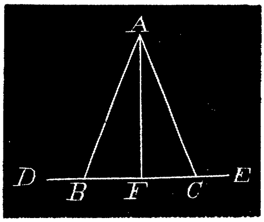
Also solved by *L. E. Pratt, Alfred Hume. G. B. M. Zerr*, and *J. F. W. Scheffer.*

**8. Proposed by ADOLPH BAILOFF, Durand, Wisconsin,**

If the two exterior angles at the base of a triangle are equal, the triangle is isosceles.

**Solution by MISS GRACE H. GRIDLEY, Student in Kidder Institute, Kidder, Missouri; and P. S. BERG, Apple Creek, Ohio.**

Let the exterior angles, $ABD$ and $ACE$ of the triangle $ABC$ be equal. To prove the triangle isosceles.




PROOF: $\angle ACE+\angle ACF=2$rt. $\angle$s.

Also $\angle ABD+\angle ABF=2$rt. $\angle$s.

$\therefore\ \angle ACE+\angle ACF=\angle ABD+\angle ABF.$

(Things equal to the same thing are equal to each other).

But $\angle ACE=\angle ABD$. (HYP.)

$\therefore \angle ACF=\angle ABF.$

(If equals be subtracted from equals, the remainders are equal).